

# THE THREE STOOGES

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## INSTRUCTION MANUAL

## ADDENDUM

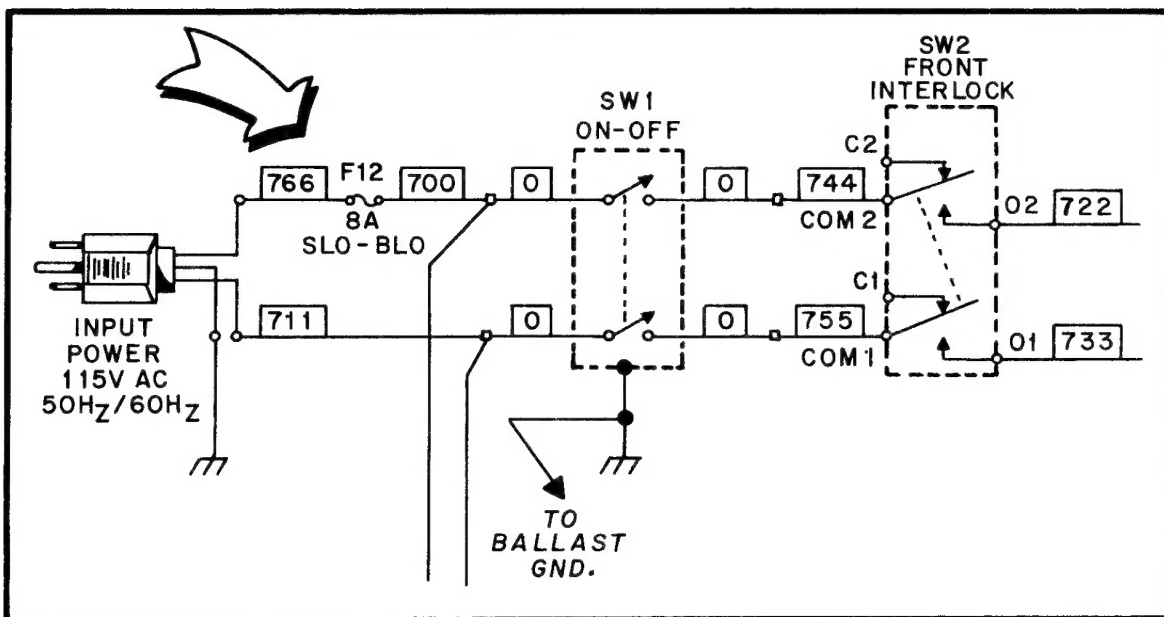
### ATTACHED TO AND PART OF THE THREE STOOGES (GAME GV-113) INSTRUCTION MANUAL

GAME AS SHIPPED VARIES FROM THE INSTRUCTION MANUAL AS PRINTED

1. Add the following to VIII. GENERAL INFORMATION--C. FUSES--BOTTOM PANEL on page 9 of the instruction manual:

F12 INPUT LINE FUSE      8 Amp SLO-BLO      PART NO. EL-26

2. Make the following changes as shown in the figure below, in the partial illustration of the PRIMARY POWER/FILTER BOARDS/INTER-CONNECTION DIAGRAM schematic on pages 30, 31 and 32 in the instruction manual:
  - a) Add fuse F12 to the POWER INPUT LINE as shown in the figure below.
  - b) Change wire color 700, between POWER LINE INPUT and F12 to 766, add wire color 700 from the F12 Fuse (Output Side), to the junction of the 0 wire which is part of SW1 and wire 700 which goes to A12J2-1



# THE THREE STOOGES (GAME GV-113) INSTRUCTION MANUAL

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**WELLS GARDNER MONITOR,  
SERVICE AND OPERATION MANUAL (Attached)**

**WARNING:** This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference."

## NOTICE

**WARRANTY INFORMATION IS LOCATED ON THE INSIDE BACK COVER**

**OR SERVICE, CALL TOLL FREE: 1-800-323-9121; (ILLINOIS) 1-800-942-1**

## I. INSTALLATION

# THE THREE STOODGES

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### A. SET-UP

1. Carefully inspect the exterior of the game for any damage which might have occurred during shipment.
2. Unlock and open the rear cabinet door.
3. Check that all plug in connectors are seated firmly. The connectors are keyed so they will only go in one way.
4. Remove the binding strap from the line cord, and install the line cord plate in the groove provided.
5. Cabinet levelers (2) are stored within the cash box for shipping purposes. Install and adjust as necessary.

### B. CHECK-OUT

1. Check that all cables are free of moving parts.
2. Check for any loose wires.
3. Check for loose solder or foreign matter on switches and power supply assemblies.
4. Be certain all fuses are seated firmly.
5. Be sure transformer wiring corresponds to the supply voltage.
6. Refer to section VI to make all the necessary game adjustments.
7. Reassemble the game.
8. Plug the line cord into a properly grounded 3-wire receptacle ONLY!!

### C. CONTROL PANEL REMOVAL

1. Unplug the game.
2. Unlock and open the coin chute door.
3. Reach in through the coin chute door and remove the wing nut and flat washer from each of the two carriage bolts which secure the control panel to the game. Unlatch the control panel latch at the top center of the panel. Note where the latch strike plate is located. Remove the carriage bolts.
4. Pull the control panel back, grasp it at the front edge as far back as it will go (approximately  $\frac{1}{4}$ ").
5. Raise the front of the control panel approximately one inch above its supports and lift the entire assembly high enough to disconnect A9J1/A9P1 and A9J2/A9P2.
6. Remove the entire control panel assembly from the game.
7. The joystick's and leaf-switches are now accessible for removal or cleaning.
8. For reassembly, reverse the above procedure.

### D. MONITOR REMOVAL

1. Unplug the game.
2. Perform the control panel assembly removal procedure (Section C).
3. Unlock and open the rear cabinet door.
4. NOTE: The color monitor contains HIGH VOLTAGES delivering LETHAL quantities of energy. Do not attempt to service the

# **I. INSTALLATION, II. INITIALIZATION, III. GAME OPERATION**

## **I. INSTALLATION**

monitor until you have shorted the anode plug on the picture tube to ground.

5. Disconnect the video plug A17J1, the monitor power supply plug A12J3/A12P3 and the ground wire from the monitor chassis.
6. From the rear of the game, remove the one nut and one washer from each of the four carriage bolts used to secure the monitor to the platform.
7. Remove the monitor from the rear of the game, being careful to clear all cables from the CRT neck.
8. For reassembly, reverse the above procedure.

### **E. SPEAKER ASSEMBLY AND MARQUEE REMOVAL**

1. Unplug the game.
2. Unlock and open the back door.
3. Unplug the A15-J1/P1 connector.
4. Unlatch the two latches on the rear of the Speaker Assembly Panel located inside the back door above the monitor.
5. On the front of the game, pull down on the lower molding under the marquee. The Speaker Assembly will lower to allow removal of the marquee.

6. Remove the marquee by lifting it upward out of its track. The Speaker Assembly and Illumination Assembly are now accessible for servicing.
7. Tilt the front of the Speaker Assembly downward while lifting the center upward.

Pull the assembly straight out to remove. Be careful not to pinch the Speaker Assembly cable.

8. For reassembly, reverse the above procedure. When replacing the marquee:
  - a. Tilt the front of the Speaker Assembly downward.
  - b. Place the bottom of the marquee in the lower molding track on the front of the assembly.
  - c. Apply slight pressure with your thumbs to the lower left and right corners of the marquee.
  - d. Slowly raise the Speaker Assembly until the top of the marquee is in place in the upper track in the top molding.
  - e. Be certain to reconnect the A15-J1/P1 connector and relatch the rear assembly latches.

## **II. INITIALIZATION**

### **TURN GAME ON**

Immediately, the coin chute lamps and the speaker marquee lamp will turn on.

### **AFTER A TEN SECOND DELAY**

- A. The attract mode appears on the screen.

- B. The playing field cycles through the following:

1. High Game to Date screen
2. Instruction Set
3. Game Play Cycle

## **III. GAME OPERATION**

### **A. GAME START**

1. Insert coins into coin chute.
  - a. Coin chute tune is played.
  - b. Total credits are displayed on screen.
2. Press one (Larry), two (Moe) or three (Curly) player

button to start game.

- a. Total credits are decreased by one, two or three.
- b. Choose Larry, Moe or Curly by moving the respective joystick.
- c. Game initializes.

### III. GAME OPERATION, IV. GAME PLAY AND SCORING

#### B. ONE PLAYER

1. The player's selected Stooge picture and name is displayed at top of screen.

#### C. ADDITIONAL PLAYERS

1. Additional players are indicated by their selected Stooge picture and name at top of screen.

#### D. EXTRA STOOGES

1. Each player will begin with

three Stooges (dependent on option/parameter settings).

2. Extra Stooges are earned by achieving certain score levels (dependent on option/parameter settings).

#### E. GAME OVER

1. When each player loses his last Stooge, his name with the words Game Over will transfer to the bottom of the screen.

### IV. GAME PLAY AND SCORING

# THE THREE STOOGES

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### HOW TO PLAY

The object of the "Three Stooges" game is to rescue the three brides, Cora, Nora and Dora from the evil Doctor, I.M.Acad M.D.

One, two or three players can choose their favorite Stooge and play either as a team, or against one another. In a one player game the game is played against the computer.

"Three Stooges" consists of seven scenes: (1) The Office; (2) The Parlor; (3) The Kitchen; (4) The Singers; (5) The Art Gallery; (6) The Police Station; and (7) The Laboratory. The players must pick

up their respectively colored key in each of the seven scenes, and exit the room. Each scene is repeated in all four levels of difficulty.

The game play starts with all three Stooges in the midst of the first scene, the "Office". With the help of the player controlled joystick, the player searches for a hammer. With the hammer the player can either break furniture to find the keys, or hit the cops and villains which are worth points. The player can also pick up pies, which are located on unbreakable tables and throw them

## IV. GAME PLAY AND SCORING

at unsuspecting cops and villians. The player must be careful though, because a pie thrown haphazardly will break windows along the sidewalls encouraging more cops to enter the room. Picking up a pie will also cause the player to lose the hammer. If a player chooses to slap a villian by pressing the slap/throw button on the control panel, the villian will be stunned and if a hammer was being carried, it will be dropped.

Each scene is completed when all three keys are retrieved and the Three Stooges exit the room. All three keys must be picked up to open the exit door.

The players must be very careful during the "Singer" scene. The key for each of the players is located in one of the smaller rooms. When entering the room the player must be quick about retrieving the key because the opera singers "blue note" is lethal. The singers can be silenced by hitting them in the face with a pie.

During the first level of the "Laboratory" scene, there are no brides present. The evil Doctor, I.M. Acad M.D., stands atop the laboratory and as the players pick up their keys the Doctor starts leaving the room. The players must exit in time to capture the Doctor or the round begins over again.

The first of the three brides, Cora, appears at the start of the second level "Laboratory" game. The players must retrieve the keys to change the color of the cage in which Cora is locked. The cage must then be broken with a hammer, Cora rescued, and exit the room.

Nora, the second bride appears during the third "Laboratory" round and Dora, the third bride, appears during the fourth "Laboratory" round.

When Dora has been saved, this will complete the first four levels of the game. The game now repeats the order of the first four levels, with the evil Doctor coming out again in the "Laboratory" scene of level five.

BREAKING WINDOW = 100 POINTS

### VILLIANS

a. Muffy = 200 POINTS  
b. Beauregard = 200 POINTS

COPS (Flatfoot) = 500 POINTS

### LOOT

a. Key = 500 POINTS  
b. Oscar = 500 POINTS  
c. Star = 500 POINTS  
d. Money bag = 500 POINTS

SCIENTIST = 500 POINTS

### THREE STOOGES

a. Larry = 500 POINTS  
b. Moe = 500 POINTS  
c. Curly = 500 POINTS





## V. SOUND/SPEECH, VI. GAME ADJUSTMENTS / OPTIONS

## V. SOUND/SPEECH

SPEECH	OCCURENCE
"Hello"	Moe, Larry or Curly when chosen as a player.
"Oh a wise guy, huh"	Moe, Larry or Curly when contacted.
"Cheese it boys, it's the cops"	Moe, when cops enter room.
"Ow"	Moe, when hit with hammer or slapped.
"Spread Out"	Moe, when contacted.
"What's the matter, knucklehead"	Moe, when contacted.
"AAAH HH"	Larry, when contacted.
"Hey, watch out"	Larry, when contacted.
"YAK, YAK, YAK"	Curly, when contacted.
"NAYAUGH, NAYAUGH, NAYAUGH"	Curly, when contacted.
"Oh, look at the grouse"	Curly, during break screen (4th level).

## VI. GAME ADJUSTMENTS / OPTIONS

### A. CONTROL BOARD SWITCH ADJUSTMENTS

**SWITCH 1** \_\_\_\_\_ **LIVES PER GAME**

OFF ..... 3 LIVES

ON ..... 5 LIVES

**SWITCH 2** \_\_\_\_\_ **ATTRACT PLAY**  
OFF ..... SOUND  
ON ..... NO SOUND

SWITCHES		COIN/CREDITS
3	4	
OFF	OFF	1/1
ON	OFF	1/2
OFF	ON	2/1
ON	ON	FREE PLAY

**SWITCH 5** \_\_\_\_\_ NOT USED  
 OFF .....  
 ON .....

**SWITCH 6** \_\_\_\_\_ **DIFFICULTY CONTROL**  
 OFF ..... NORMAL  
 ON ..... HARD

SWITCHES		EXTRA LIVES	
7	8	FIRST EXTRA LIFE	EACH ADDITIONAL LIFE
ON	ON	10,000 POINTS	EVERY 10,000 POINTS
ON	OFF	10,000 POINTS	EVERY 20,000 POINTS
OFF	ON	20,000 POINTS	EVERY 10,000 POINTS
OFF	OFF	20,000 POINTS	EVERY 20,000 POINTS

## B. SOUND ADJUSTMENTS

The audio output is controlled by the potentiometer mounted on the service panel assembly (located inside the coin mechanism door).

Turning the potentiometer counter-clockwise will decrease the volume. Turning it clockwise will increase the volume.

## C. MONITOR ADJUSTMENTS

Normally, few if any adjustments are required for proper monitor operation. However, after any major repairs to the monitor chassis refer to the attached monitor manual.



## VII. BOOKKEEPING AND SELF TEST

### SELF TEST

The battery back-up bookkeeping functions of this game are contained in Self Test steps 3 and 4. These are in addition to the electro-mechanical coin counter located inside the front door panel. Every time a coin is inserted into a coin slot, the counter is energized, incrementing the count.

The self-test consists of six functions which may be used to identify problems in the video system and to change program parameters.

The self-test mode is entered by setting the self-test toggle switch located inside the cash door to "TEST". A selection of available tests is displayed on the monitor. To return to the GAME mode at any time, the operator needs only to set the toggle switch back to "GAME".

Selection of tests is done with the push button switch labeled "SELECT". Upon entering the test mode, a flashing arrow points to the first test selection. Momentarily depressing the "SELECT" button will advance through each selection one by one.

When the arrow is pointing to the desired test, the operator may begin that test by pressing the "SELECT" button and holding it down until the test appears on the screen.

Once a test has been selected, the operator can return to the selection list by holding down the select switch until it re-appears. The six tests are as follows:

#### 1. MONITOR ADJUSTMENT

Four patterns can be displayed on the screen for adjusting monitor color, brightness, contrast and convergence. The patterns are: Color bars, a cross-hatch, a gray scale, and a dot pattern. By momentarily pressing the select switch, the operator may cycle through the four patterns.

#### 2. MEMORY TEST

For each RAM memory chip: An OK or an NG (no good) appears signaling that the chip is good or bad respectively.

Check sums are displayed for each ROM memory chip. If you have a suspect ROM, refer to your distributor for the correct check sum number.

### 3. SOUND/SPEECH TEST

After selecting this test, a count will appear on the screen, representing the various sounds that are produced by the game. All the different game sounds will be produced and the screen count will repeat to 01. Pressing the MOE button will suppress all sound output and speed up the count so a particular sound can be sought out and checked.

### 4. BOOKKEEPING

Selecting this test will display a menu of four functions. Pushing the SELECT button momentarily will move an arrow on the screen. When the arrow points to the desired function, press the MOE button on the control panel to perform that function.

**DISPLAY SCORE COUNTS** — A table is shown with 20 categories of score values by thousands (K) and a count associated with each category. The count represents the number of plays in which the score at the end of the game fell into that category. In addition, a high score, low score, and average is shown along with the total number of plays on which the average is based. To clear the table, press the MOE button and return to the menu by holding down SELECT.

**DISPLAY TIME COUNTS** — Same as above except each category represents play times in seconds. The high, low, and average are given in minutes and seconds.

**DISPLAY ROUND COUNTS** — Same as above except each category represents the round in which the games ended.

Note: Each of these tables are independent of the others. Any table may be cleared without affecting the others in any way.

**RESET HIGH SCORE** — Pressing the MOE button will reset the Top Bananas table (all-time high scores).

## **VII. BOOKKEEPING AND SELF TEST**

### **5. DIP SWITCHES**

A functional description of the eight Dip Switches located on the Logic Board Assy. is displayed. Changing any switch will cause an immediate update of the description displayed on the screen.

### **6. SWITCH TEST**

Pressing any player button, coin switch or moving the joysticks in any direction will display an OK for each switch closure.

## VIII. GENERAL INFORMATION

### A. PRINTED CIRCUIT BOARDS ARE DESIGNATED AS FOLLOWS:

- A1 Logic Board Assy.
- A3 Power Supply Assy.
- A6 Sound Board Assy.
- A7 Diode Board
- A8 Filter Board

### B. WIRE COLORS ARE SHOWN AS NUMBERS:

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Purple
3 Orange	8 Gray
4 Yellow	9 White

For example, 688 is a Blue - Gray - Gray striped wire.

### C. FUSES

#### BOTTOM PANEL

F1	115V AC 60 Hz (Primary Power)	3 Amp SLO-BLO
F2	6.3V AC (Coin Chute Lamps)	1 Amp SLO-BLO
F3	Monitor	2 Amp SLO-BLO
F4	9V AC (+5V DC)	12 Amp SLO-BLO
F5	15V AC $\left( \begin{array}{l} +12V\ DC \\ -12V\ DC \end{array} \right)$	2 Amp SLO-BLO
F6	15V AC $\left( \begin{array}{l} +12V\ DC \\ +20V\ DC \end{array} \right)$	2 Amp SLO-BLO
F7	Audio Amplifier Supply	1.5 Amp SLO-BLO
F8	9V AC (RESET)	1/4 Amp SLO-BLO

## VIII. GENERAL INFORMATION

### POWER SUPPLY SPECIFICATIONS

LOCATION	VOLTAGE	PROTECTION
Logic Board Assy. (A1)	+5V DC	Voltage adjustable. 6 Amps over-voltage protection and fused for over-current protection.
Sound Board. (A6)	+12V DC -12V DC	1.5 Amp fused for over-current protection. The plus and minus 12 volt supplies use the LM340K-12 and LM320T-12 IC regulators respectively.
Coin Meter	+20V DC	Full wave rectified unfiltered voltage, 1.5 Amp fused for over-current protection.
Coin Chute Lights	6.3V AC	AC voltage, 1 amp fused for over-current protection.
Monitor and Marquee	100V AC or 115V AC, 60HZ	Isolated, fused AC voltage.

**WARNING:** The Shield Top covering the Master Electronics Panel will have to be removed in order to make some adjustments to the printed circuit boards. This cover is used, in part, to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules. Failure to replace the Shield Top over the Master Electronics Panel when the game is in operation voids all warranties.

## IX. THEORY OF OPERATION

### INTRODUCTION

The character based graphics system designated GG-III has two main subdivisions. The first subdivision is the Central Processor Unit (CPU) which has three partitions:

- a. Microprocessors
- b. Memory
- c. Input and Output ports (I/O)

The Intel 8088 microprocessor is used and 32K bytes of memory is reserved for programming space and has 5 input ports and 5 output ports. The second subdivision is the video state machine which generates and controls the video signal to the monitor. The state machine has three partitions:

- a. System Clock (CLK)
- b. Foreground generator (FGND)
- c. Background generator (BGND)

The system clock is driven by a 20MHZ crystal, divided down for a 5MHZ dot clock.

All inputs and outputs including the video control and general purpose I/O are memory-mapped, (i.e. everything within the system can be addressed in a single segment of 64K addresses as memory).

The video control unit is divided into an "object-oriented" foreground driver and "character-oriented" background driver. The screen resolution is 256 pixels horizontally, and 240 lines vertically for both foreground and background. The CPU communicates with the foreground driver and background driver by writing data into the

designated memory areas in a certain format. The foreground is designed to display moving objects on the screen with a minimum overhead to the processor. The game programs will only have to specify the vertical and horizontal position and the object select number to the foreground driver. The background video supplements the foreground with relatively static figures on the screen. The CPU specifies all the character positions on the screen with desired "character" patterns.

A 5MHZ system clock drives a 9 bit horizontal dot counter and an 8 bit vertical line counter. The horizontal counter counts from 0 to 255 during active scan line and 256 to 317 during horizontal blanking time. When the horizontal counter reaches 317, the horizontal counter resets to 0. At the beginning of the horizontal blanking time (horizontal counter = 256) it increments the vertical counter. The vertical counter counts from 0 to 239 during active vertical scan time and 240 to 255 during vertical blanking time.

The battery backup system supports two battery RAM's that store all of the bookkeeping functions. The battery is maintained at a +3.6V reference by a trickle charge supplied on the logic board regulated by a current limiting resistor. If the AC power to the game is interrupted, the battery allows the RAM's to store the data contained in the Distributors table and the Options/Parameters screen.

## **X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS**

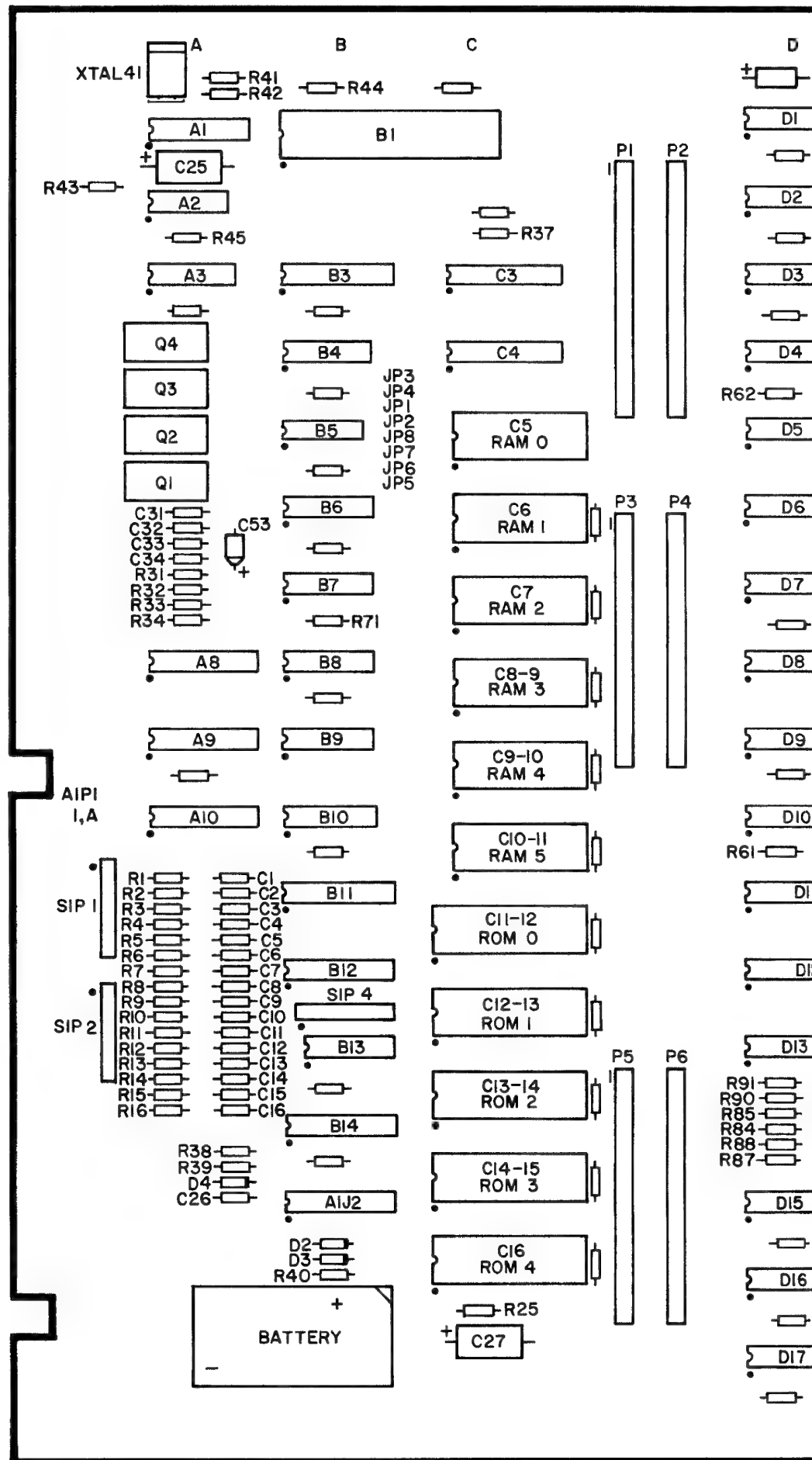
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# LOGIC BOARD ASSY. (A1), PARTS LIST

## MISCELLANEOUS ELECTRONIC COMPONENTS

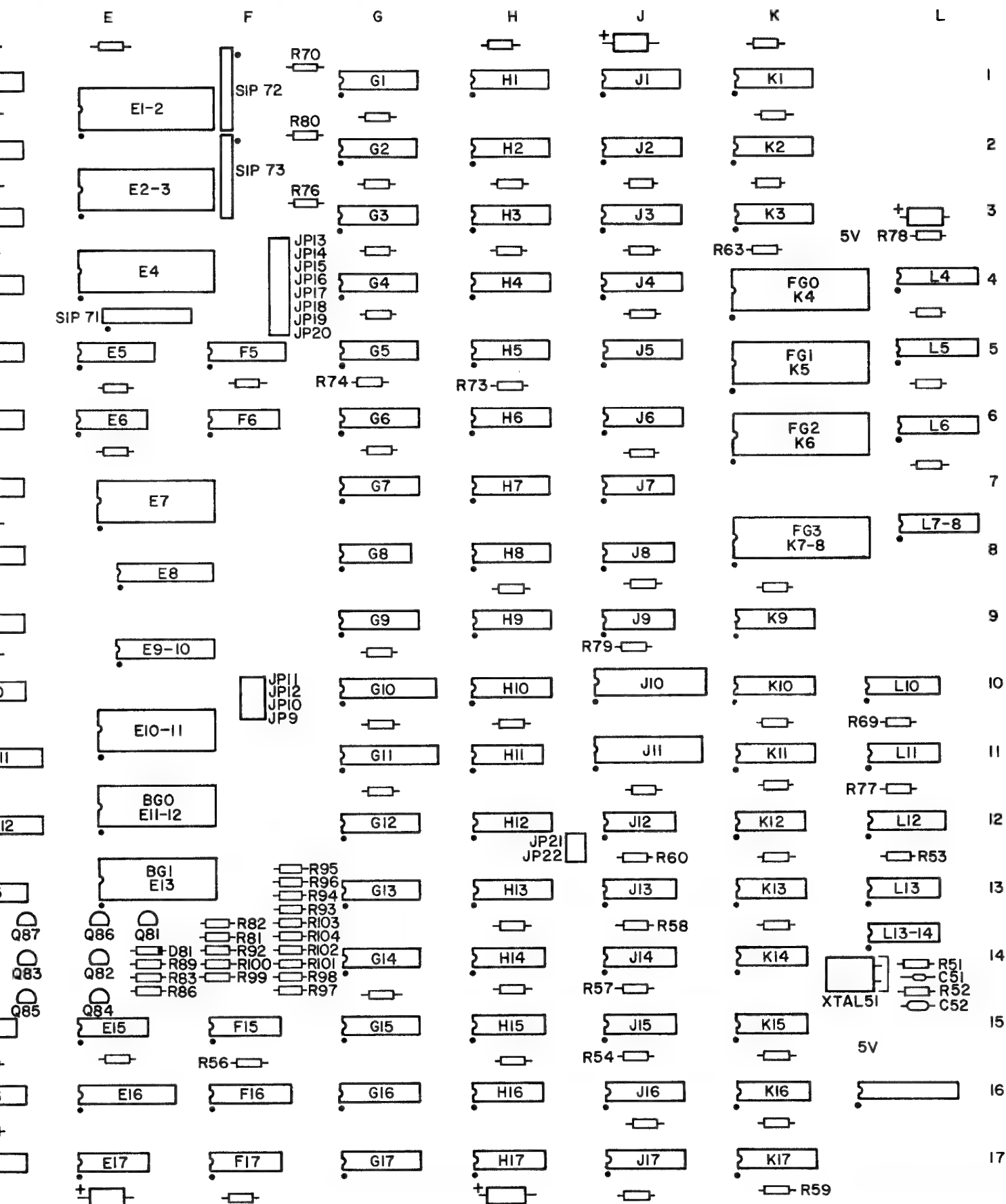
REFERENCE	DESCRIPTION	PART NO.
Bat 1	Battery, 3.6V	XO-458
C1-C16	Capacitor, 0.1 UF, 50V AX CR +80%-20%	XO-230
C25	Capacitor, 100 UF, 25V EL-AX	XO-212
C26	Capacitor, 0.1 UF, 50V AX CR +80%-20%	XO-230
C27	Capacitor, 100 UF, 25V EL-AX	XO-212
C31-34	Capacitor, 0.1 UF, 50V AX CR +80%-20%	XO-230
C51	Capacitor, 100 PF, 100V CMD 5%	XO-198
C52	Capacitor, 0.1 UF, 100V CMD 5%	XO-196
C53	Capacitor, 10 UF, 25V AX TANT 10%	XO-127
ALL UNMARKED CAPACITORS	01 UF, 50V AX CR +80%-20%	XO-229
ALL POLARIZED UNMARKED CAPACITORS	10 UF, 25V AX TANT 10%	XO-127
D2	Diode, 1N4454	XO-275
D4	Diode, 1N4733A	XO-274
D81	Diode, 1N4148	XO-261
Q1	Transistor, MPS-U45	XO-306
Q2-Q4	Transistor, 2N6044	XO-120
Q81-Q87	Transistor, MPSA70	XO-309
R1-R16	Resistor, 470 OHM, 5% 1/4W	XO-35
R25	Resistor, 1K OHM, 5% 1/4W	XO-5
R31	Resistor, 10K OHM, 5% 1/4W	XO-18
R32-R34	Resistor, 1K OHM, 5% 1/4W	XO-5
R37, R38	Resistor, 330 OHM, 5% 1/4W	XO-34
R39	Resistor, 130 OHM, 5% 1/4W	XO-172
R40	Resistor, 270 OHM, 5% 1/4W	XO-68
R41, R42	Resistor, 510 OHM, 5% 1/4W	XO-25
R43	Resistor, 130 OHM, 5% 1/4W	XO-172
R44, R45	Resistor, 1K OHM, 5% 1/4W	XO-5
R51, R52	Resistor, 330 OHM, 5% 1/4W	XO-34
R53, R54, R56	Resistor, 1K OHM, 5% 1/4W	XO-5
R57, R58	Resistor, 560 OHM, 5% 1/4W	XO-36
R59-R61	Resistor, 1K OHM, 5% 1/4W	XO-5
R63, R64	Resistor, 1K OHM, 5% 1/4W	XO-5
R70	Resistor, 1K OHM, 5% 1/4W	XO-5
R73, R74	Resistor, 1K OHM, 5% 1/4W	XO-5
R76-R80	Resistor, 1K OHM, 5% 1/4W	XO-5
R81	Resistor, 820 OHM, 5% 1/4W	XO-174
R82	Resistor, 100 OHM, 5% 1/4W	XO-28
R83, R84	Resistor, 15 OHM, 5% 1/4W	XO-171
R85	Resistor, 180 OHM, 5% 1/4W	XO-24
R86, R87	Resistor, 15 OHM, 5% 1/4W	XO-171
R88	Resistor, 180 OHM, 5% 1/4W	XO-24
R89, R90	Resistor, 15 OHM, 5% 1/4W	XO-171
R91	Resistor, 180 OHM, 5% 1/4W	XO-24
R92	Resistor, 1K OHM, 5% 1/4W	XO-5
R93	Resistor, 2K OHM, 5% 1/4W	XO-14
R94	Resistor, 1K OHM, 5% 1/4W	XO-5
R95	Resistor, 470 OHM, 5% 1/4W	XO-35
R96	Resistor, 240 OHM, 5% 1/4W	XO-173
R97	Resistor, 2K OHM, 5% 1/4W	XO-14
R98	Resistor, 1K OHM, 5% 1/4W	XO-5
R99	Resistor, 470 OHM, 5% 1/4W	XO-35
R100	Resistor, 240 OHM, 5% 1/4W	XO-173
R101	Resistor, 2K OHM, 5% 1/4W	XO-14
R102	Resistor, 1K OHM, 5% 1/4W	XO-5
R103	Resistor, 470 OHM, 5% 1/4W	XO-35
R104	Resistor, 240 OHM, 5% 1/4W	XO-173
SIP 1, SIP 2, SIP 4	Resistor, Dip, 4.7K, 9 Pin	XO-492
SIP 71, SIP 72, SIP 73	Resistor, Dip, 1K, 9 Pin	XO-493
X-TAL 41	Crystal, 15 MHZ	XO-482
X-TAL 51	Crystal, 20 MHZ	XO-494
	Dip Switch	XO-505
	20 Pin Dip Socket	XO-491
	22 Pin Dip Socket	XO-467
	24 Pin Dip Socket	XO-529
	28 Pin Dip Socket	XO-536
	40 Pin Dip Socket	XO-530





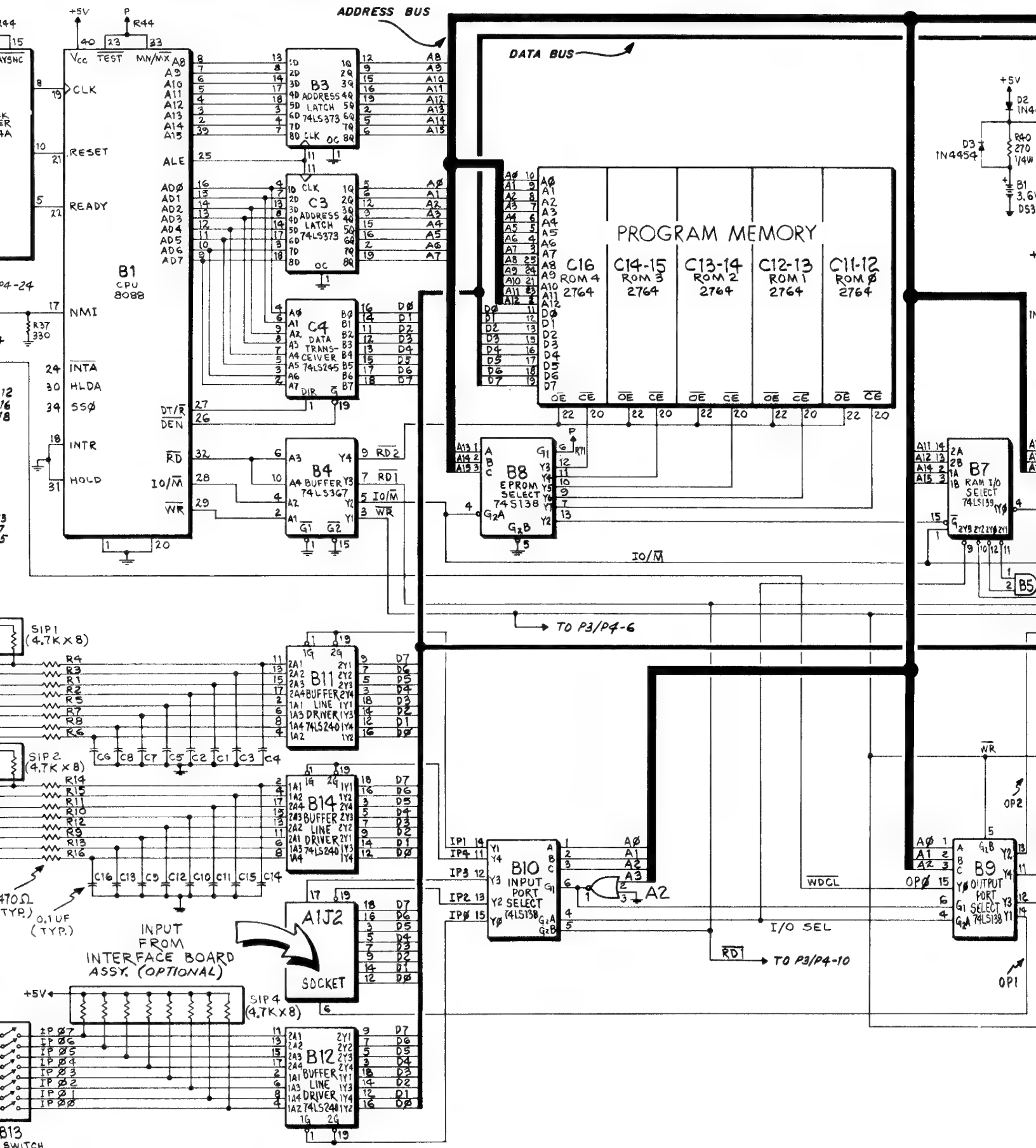
# C DIAGRAMS, PARTS LISTS

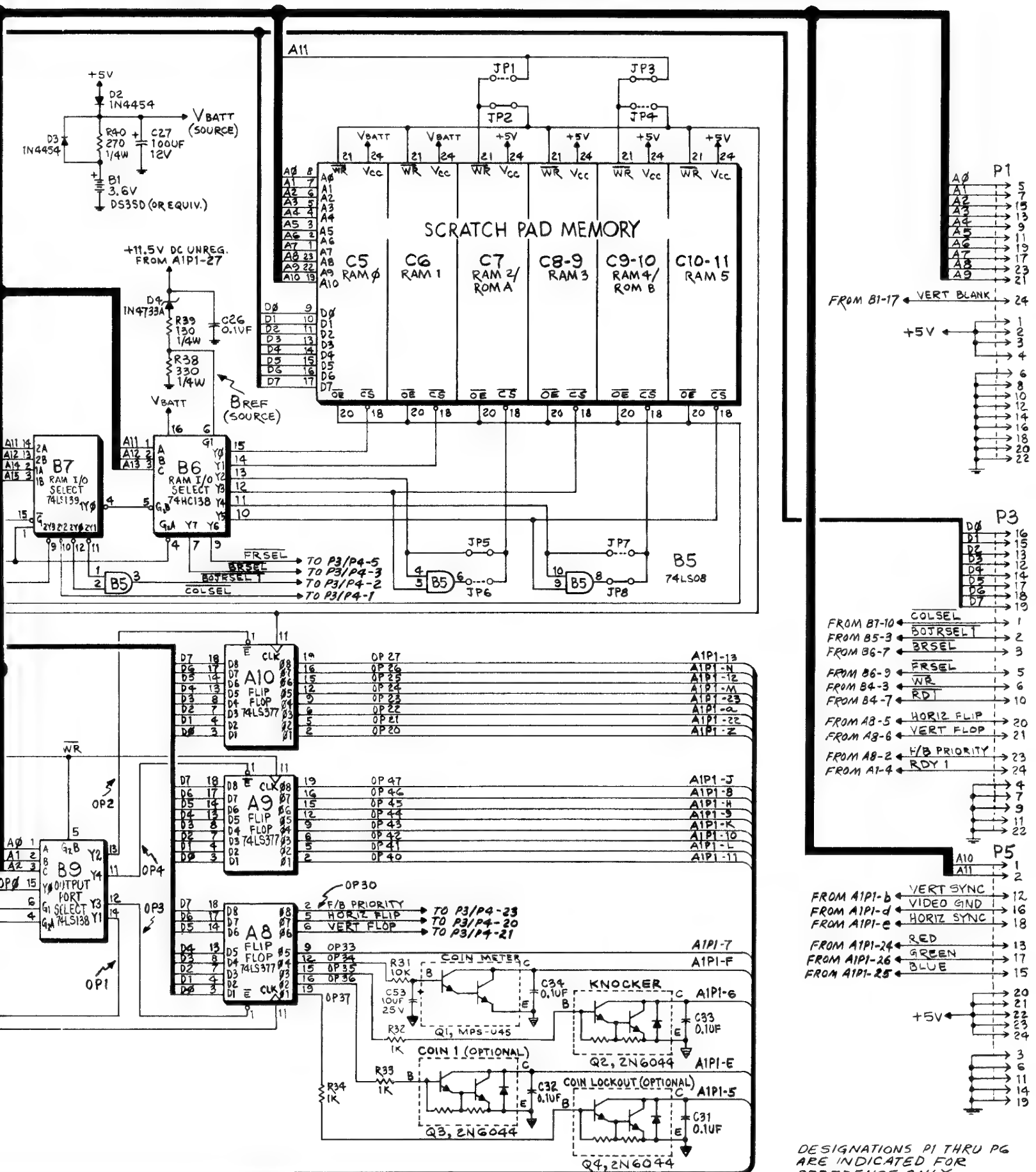
## RD ASSY. (A1), COMPONENT LOCATION





# X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS





LOGIC BOARD ASSY. (A1), SCHEMATIC DIAGRAM, SHEET 1 OF 3

ADDRESS BUS

DATA BUS

P2

5 ← A0

7 ← A1

13 ← A2

15 ← A3

9 ← A4

19 ← A5

17 ← A6

23 ← A7

21 ← A8

24 ← VERT BLANK

1 ← +5V

3 ←

6 ←

8 ←

10 ←

12 ←

14 ←

16 ←

18 ←

20 ←

22 ←

P4

16 ← D0

15 ← D1

14 ← D2

13 ← D3

12 ← D4

11 ← D5

10 ← D6

9 ← D7

1 ← COLSEL

2 ← BOJRSSEL

3 ← BRSEL

5 ← FRSEL

6 ← WR

10 ← RD1

20 ← HORIZ FLIP

21 ← VERT FLOP

23 ← F/B PRIORITY

24 ← RDY1

4 ←

7 ←

9 ←

11 ←

13 ←

P6

1 ← A10

2 ← A11

12 ← VERT SYNC

16 ← VIDEO GND

18 ← HORIZ SYNC

13 ← RED

17 ← GREEN

15 ← BLUE

20 ← +5V

21 ←

22 ←

23 ←

24 ←

3 ←

6 ←

11 ←

14 ←

13 ←

DESIGNATIONS P1 THRU  
P6 ARE INDICATED FOR  
REFERENCE ONLY.

H0

CLK

HCLK

CLK

HCLK

H1

H2

H3

H4

H5

H6

H7

H8 (H BLANK)

317

H8

P

R54

317

H0

H1

H2

H3

H4

H5

H6

H7

H8

H9

H10

H11

H12

H13

H14

H15

H16

H17

H18

H19

H20

H21

H22

H23

H24

H25

H26

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H29

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H50

H51

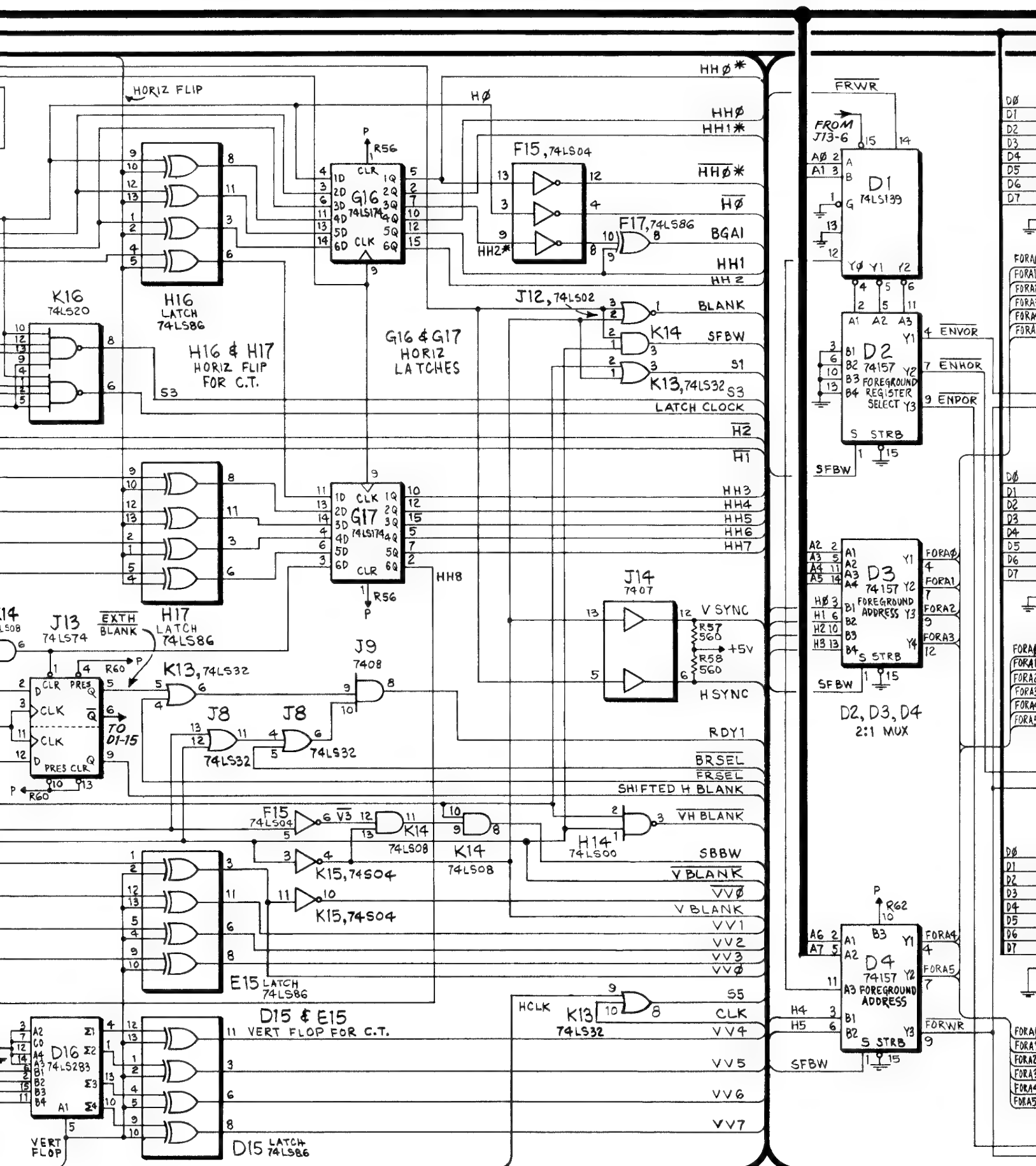
H52

H53

H54

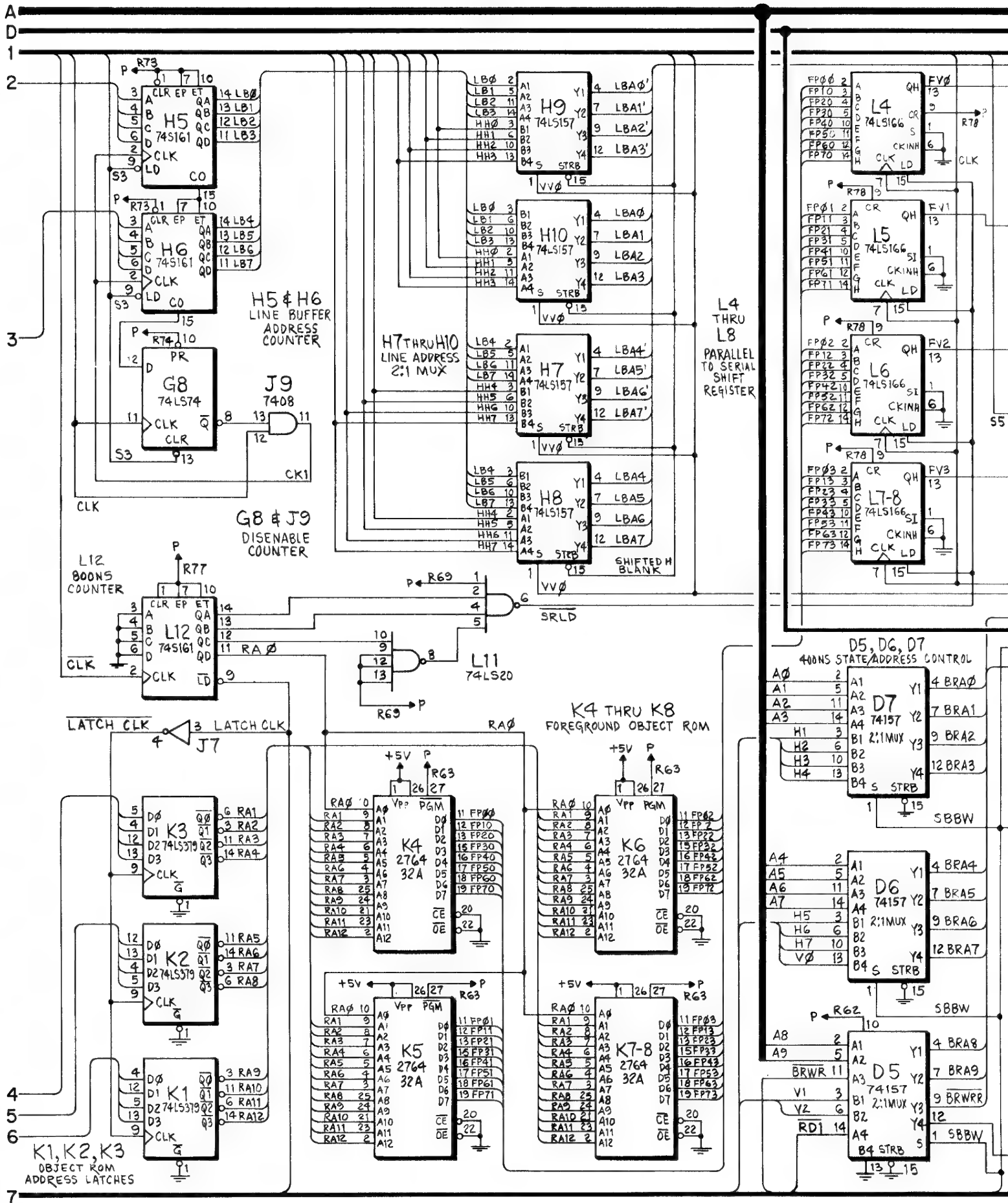
H55

## X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

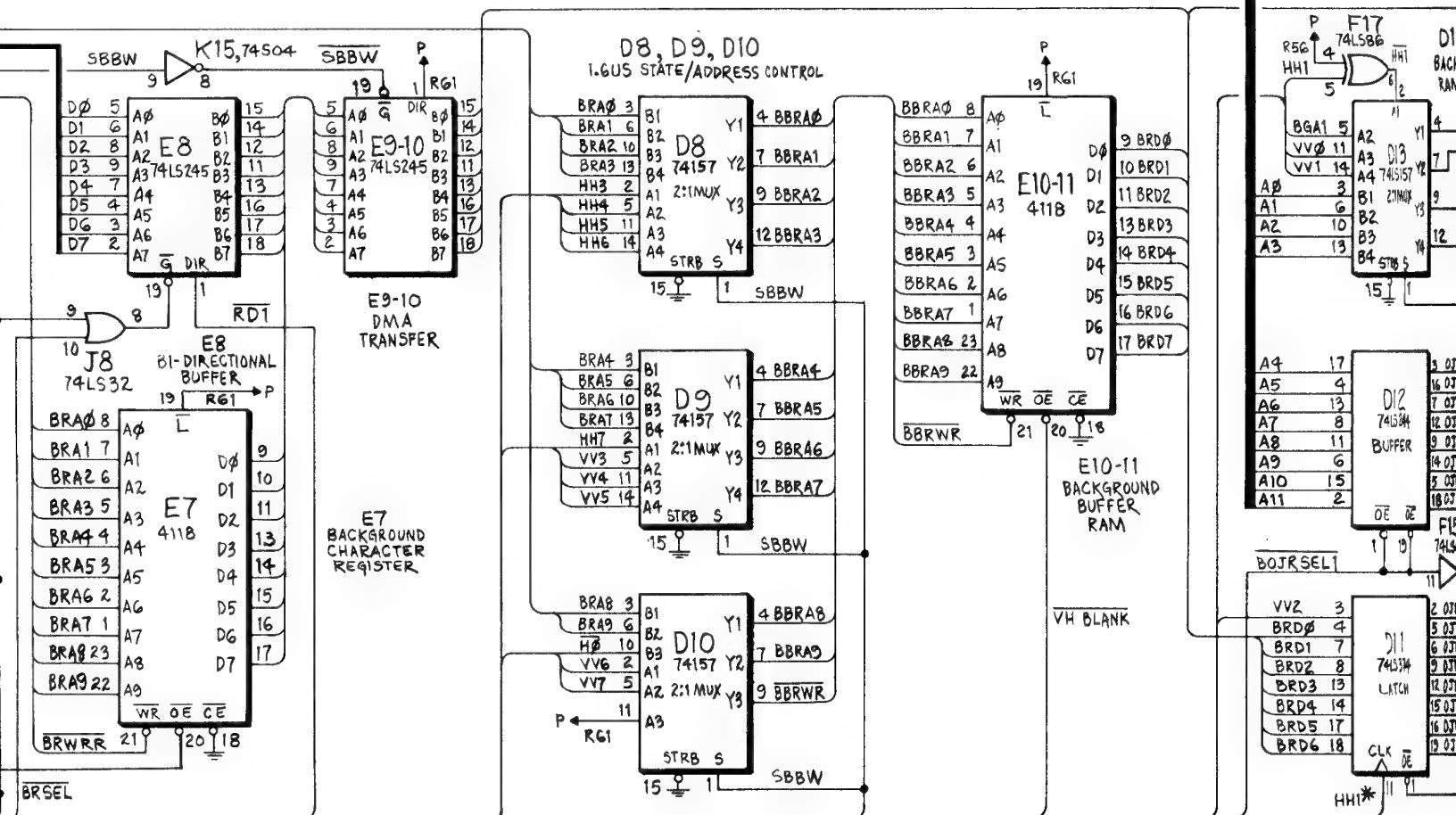
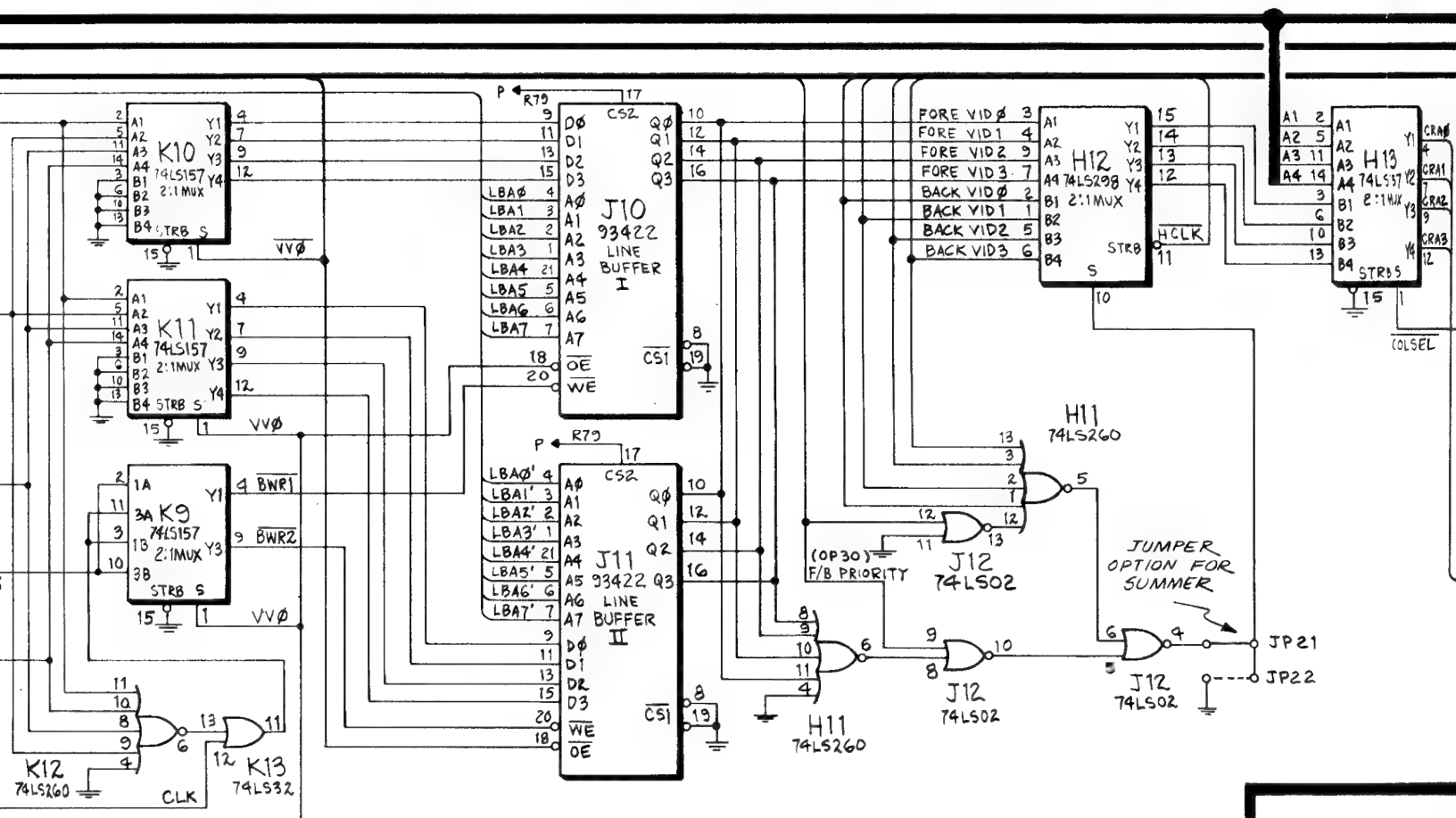








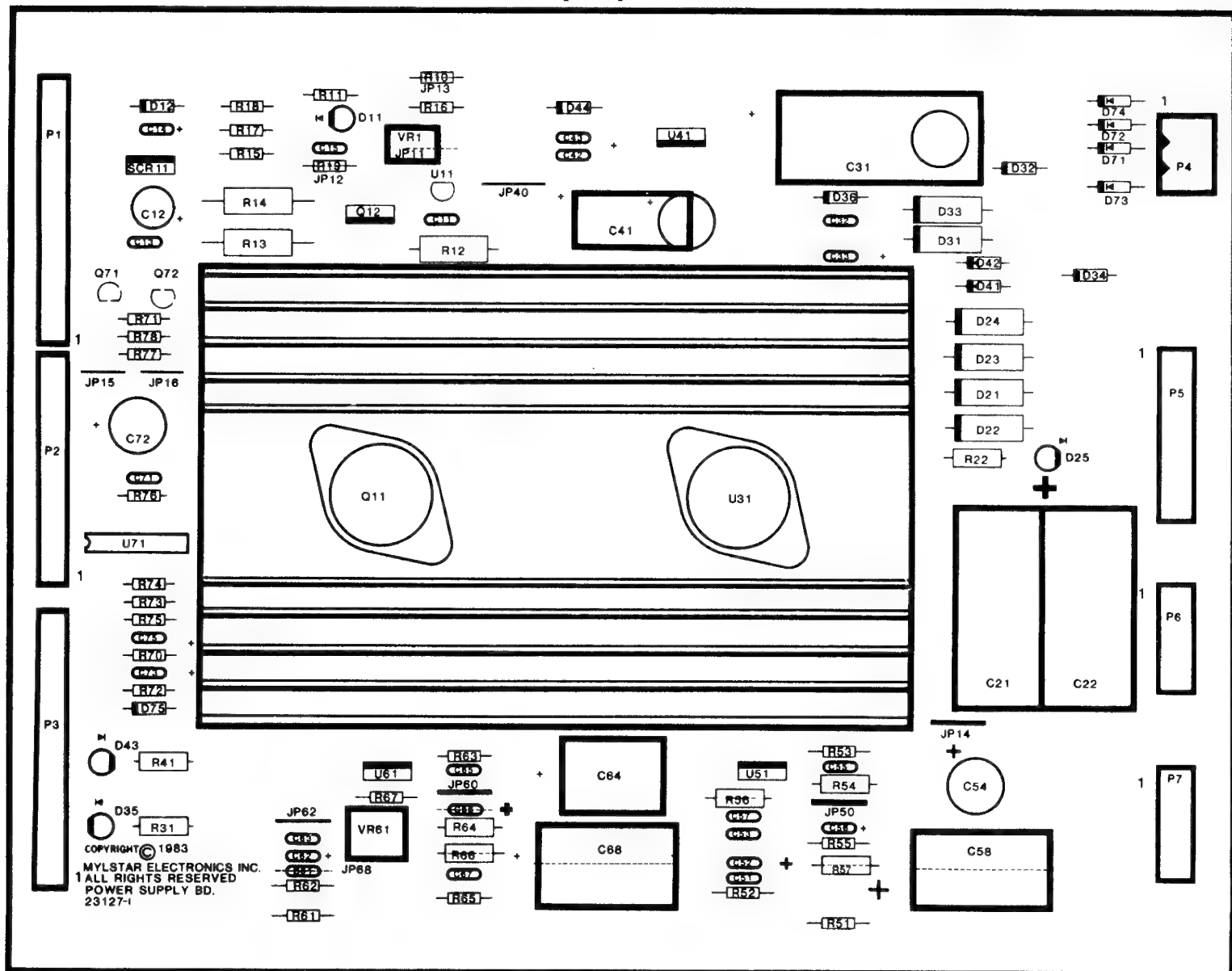
# X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS





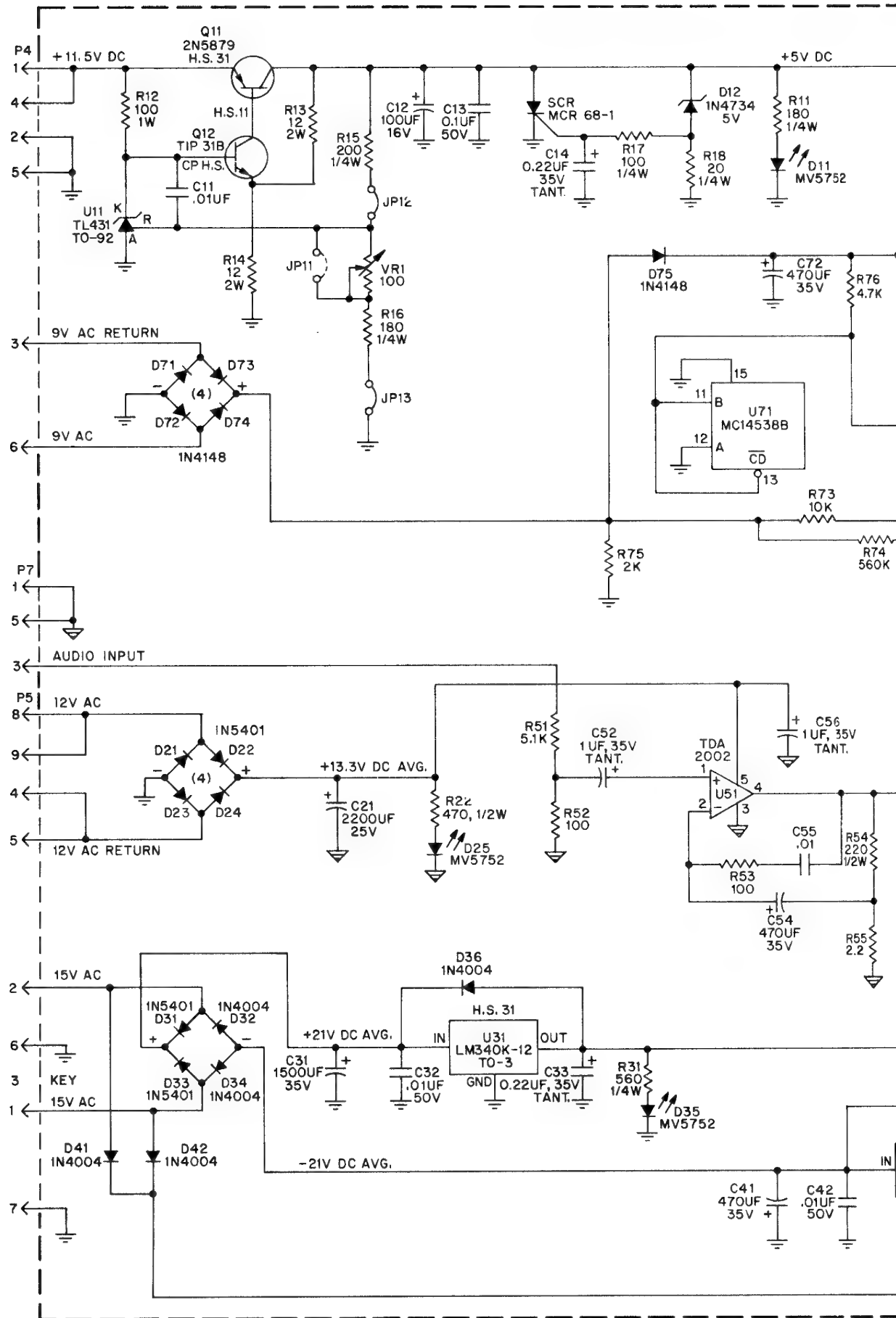
# X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

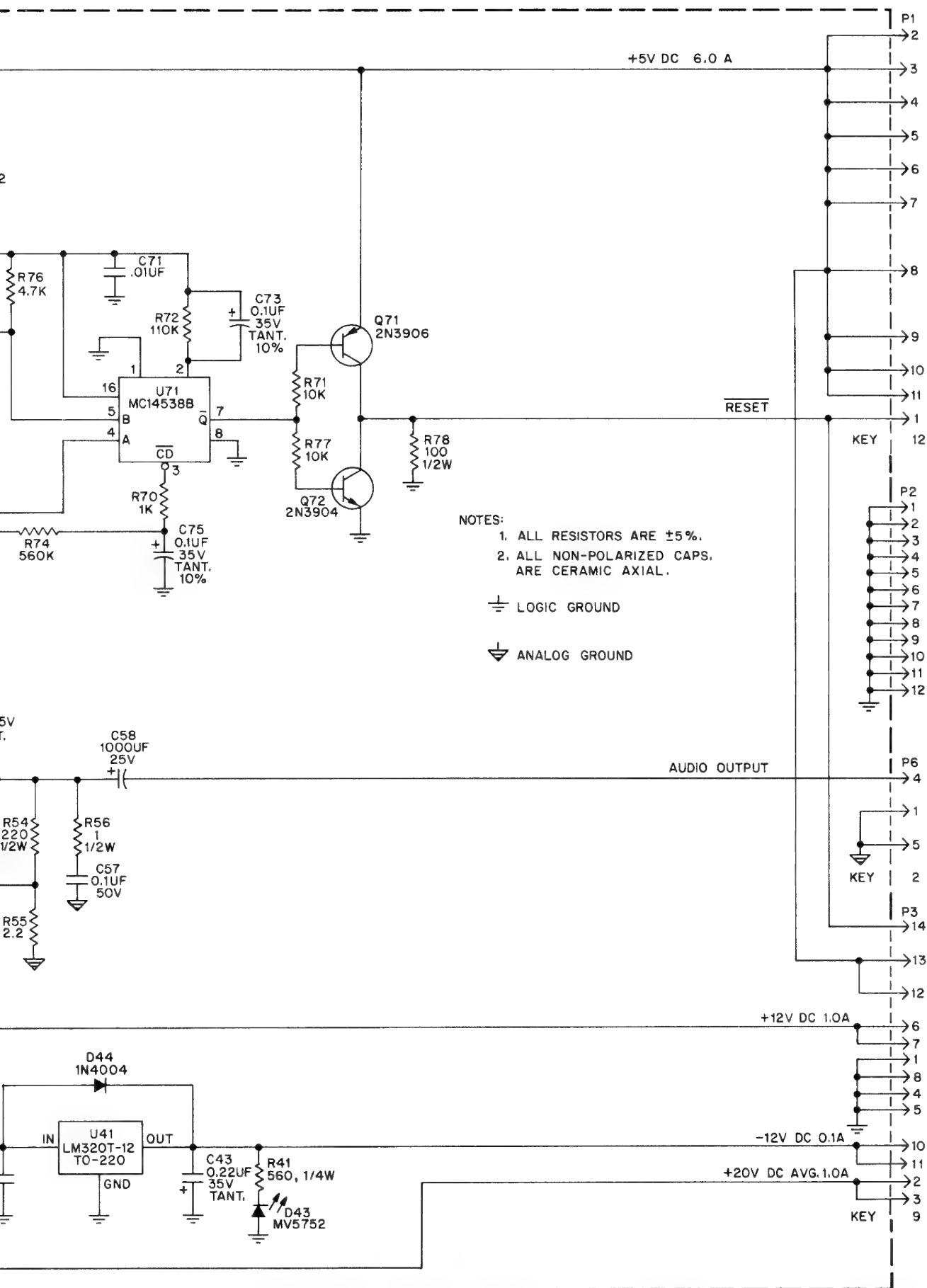
## POWER SUPPLY ASSY. (A3), COMPONENT LOCATION



## POWER SUPPLY ASSY. (A3), PARTS LIST

REFERENCE	DESCRIPTION	PART NO.	REFERENCE	DESCRIPTION	PART NO.
C11, C32, C42, C55, C71	Power Supply Assembly	MA-479	R12	Resistor, 100 OHM, 5%, 1W	XO-137
C12	Capacitor, .01UF, 50V	XO-229	R13, R14	Resistor, 12 OHM, 5%, 3W	XO-138
C13, C57	Capacitor, 100UF, 16V	XO-235	R15	Resistor, 200 OHM, 5%, 1/4W	XO-143
C14, C33, C43	Capacitor, .1UF, 50V	XO-558	R17, R52, R53	Resistor, 100 OHM, 5%, 1/4W	XO-28
C21	Capacitor, .22UF, 35V	XO-615	R18	Resistor, 20 OHM, 5%, 1/4W	XO-29
C31	Capacitor, 2200UF, 25V	XO-346	R22	Resistor, 470 OHM, 5%, 1/2W	XO-55
C41	Capacitor, 1500UF, 35V	XO-616	R31, R41	Resistor, 560 OHM, 5%, 1/4W	XO-36
C41, C54, C72	Capacitor, 470UF, 35V	XO-284	R51	Resistor, 51.1K OHM, 5%, 1/4W	XO-40
C52, C56	Capacitor, 1UF, 35V	XO-715	R54	Resistor, 220 OHM, 5%, 1/2W	XO-185
C58	Capacitor, 1000UF, 25V	XO-218	R55	Resistor, 2.2 OHM, 5%, 1/4W	XO-595
C73, C75	Capacitor, .1UF, 35V	XO-614	R56	Resistor, 1 OHM, 5%, 1/2W	XO-593
D11, D25, D35, D43	Diode, Light Emitting MV-5752	XO-270	R70	Resistor, 1K OHM, 5%, 1/4W	XO-5
D12	Diode, Zener, 5.6V, 1N4734A	XO-255	R71, R73, R77	Resistor, 10K OHM, 5%, 1/4W	XO-18
D21-D24, D31, D33	Diode, 1N5401	XO-263	R72	Resistor, 110K OHM, 5%, 1/4W	XO-591
D32, D34, D36, D41, D42, D44	Diode, 1N4004	XO-254	R74	Resistor, 560K OHM, 5%, 1/4W	XO-704
D71-D75	Diode, 1N4148	XO-261	R75	Resistor, 2K OHM, 5%, 1/4W	XO-14
Q11	Transistor, PNP, 2N5879	XO-323	R76	Resistor, 4.7K OHM, 5%, 1/4W	XO-7
Q12	Transistor, TIP31B	XO-641	R78	Resistor, 100 OHM, 5%, 1/2W	XO-52
Q71	Transistor, PNP, 2N3906	XO-588	SCR68-1	Silicon Controlled Rectifier	XO-131
Q72	Transistor, NPN, 2N3904	XO-549	U11	Voltage Regulator, Zener TL431	XO-272
R11, R16	Resistor, 180 OHM, 5%, 1/4W	XO-24	U31	Voltage Regulator, -12V, LM340K	XO-628
			U41	Voltage Regulator, -12V, LM320T	XO-613
			U51	Audio Amplifier, LM200T	XO-550
			U71	IC, CMOS	XO-564
			VR1	Potentiometer, 100 OHM	XO-134

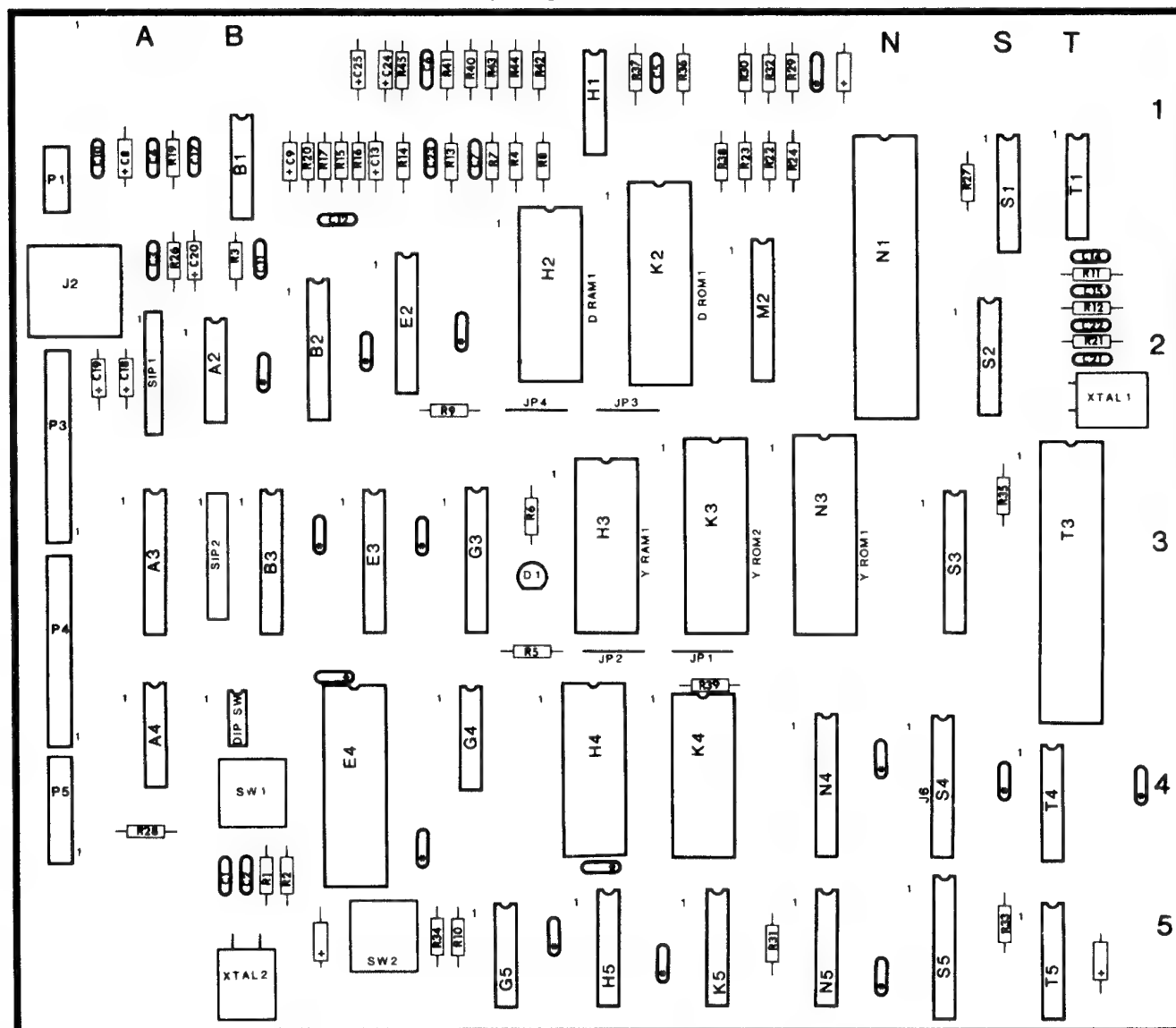




**POWER SUPPLY ASSY. (A3), SCHEMATIC DIAGRAM**

# X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

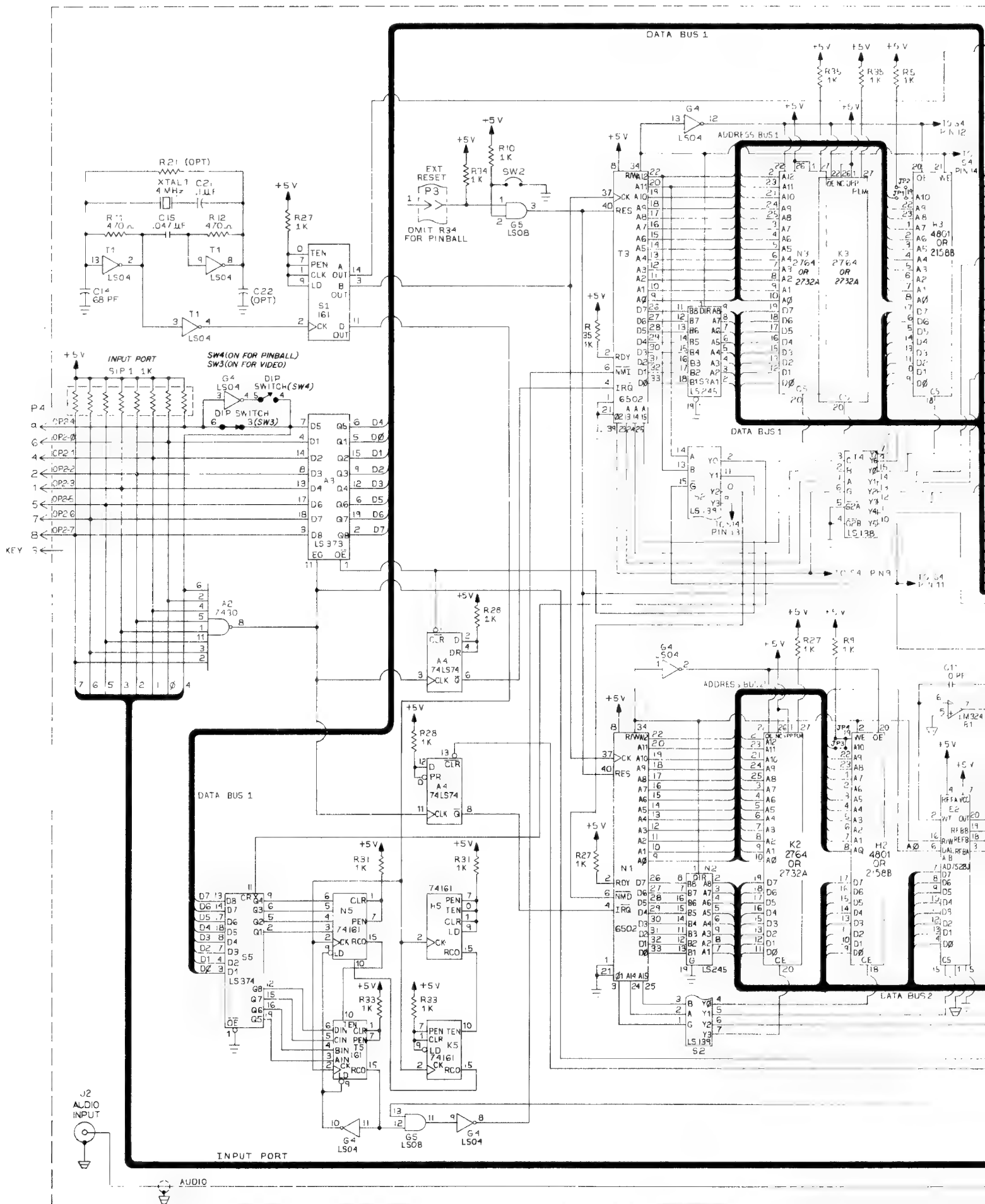
## SOUND BOARD (A6) COMPONENT LOCATION



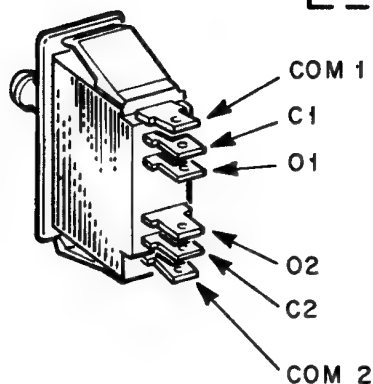
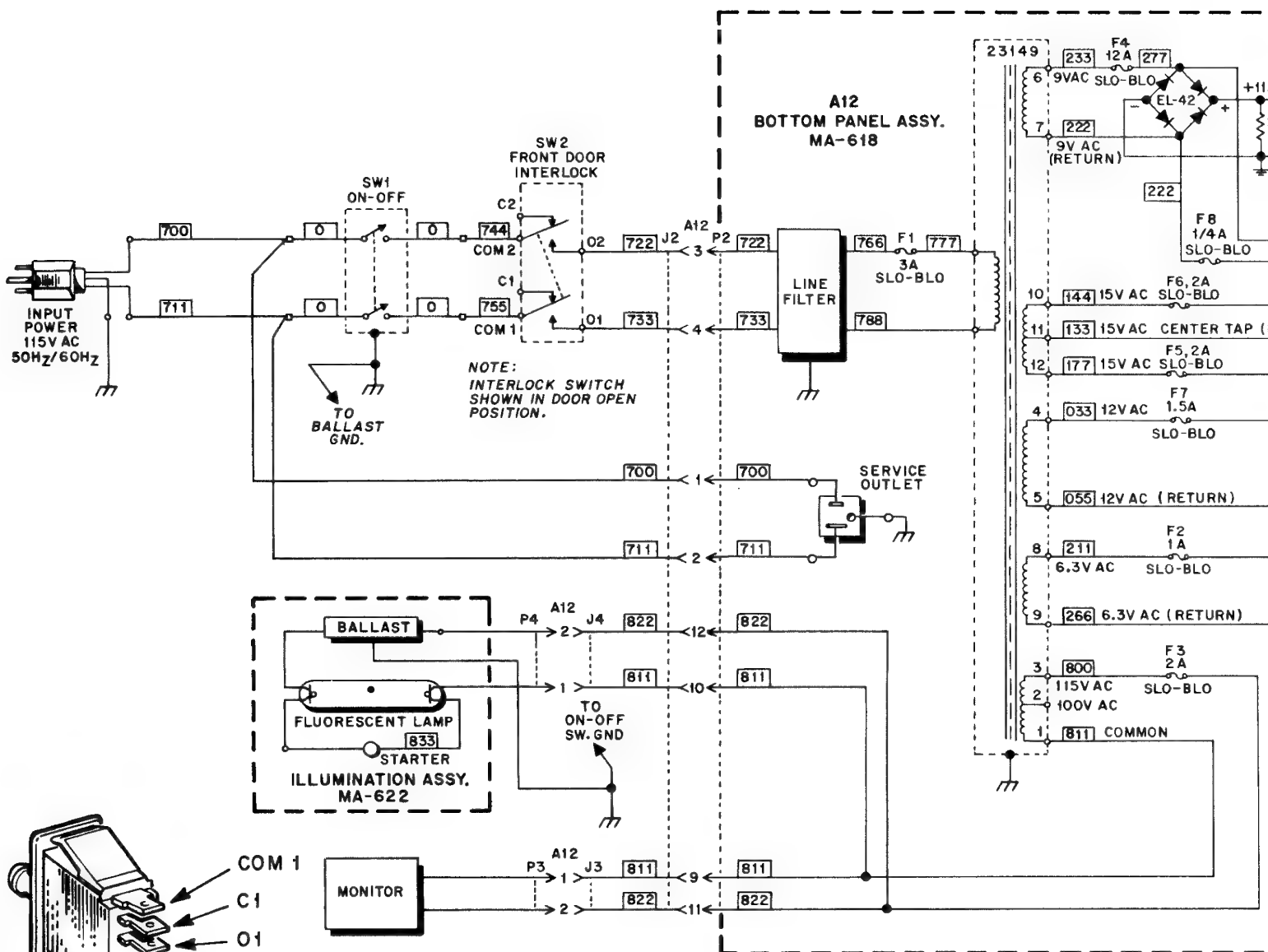
## SOUND BOARD (A6) PARTS LIST

REFERENCE	DESCRIPTION	PART NO.	REFERENCE	DESCRIPTION	PART NO.
C1, C2	Sound Board Assy	MA-495	R6	Resistor, 240 OHM, 5% 1/4W	XO-173
	Capacitor, 22PF, 50V MONO	XO-633	R11, R12	Resistor, 470 OHM, 5% 1/4W	XO-35
C3, C21	AX-CM, 10%		R14	Resistor, 6.8K OHM, 5% 1/4W	XO-8
	Capacitor, 0.1UF, 50V MONO	XO-637	R15, R20	Resistor, 1.2K OHM, 5% 1/4W	XO-175
C5, C6	AX-GL		R16, R17, R19,	Resistor, 10K OHM, 5% 1/4W	XO-18
	Capacitor, 0.1UF, 50V MONO	XO-747	R26, R29, R30,		
C7, C17, C23	AX-GL, 10%		R32, R37, R38,		
	Capacitor, 1UF, 50V CM-RD	XO-294	R40-R44		
C8, C9, C10	Non-Polarized		R36, R45	Resistor, 33K OHM, 5% 1/4W	XO-43
C18, C19, C24,	Capacitor, 10UF, 25V	XO-127	SIP1, SIP2	Resistor Pack, Sip, 1K OHM, 9 Pin	XO-493
C25	TANT-AX, 10%		SW1 SW2	Switch, Push Button, N.O	XO-365
C11	Capacitor, 10PF, 50V AX-CM,	XO-635	XTAL1	Crystal, 4.0 MHz	XO-366
	+80%-20%		XTAL2	Crystal, 312 MHz	XO-639
C13, C20	Capacitor, 1UF, 50V TANT-AX	XO-217		24 Pin DIP Socket	XO-529
C14	Capacitor, 68PF, 50V MONO	XO-636		28 Pin DIP Socket	XO-536
	AX-CM, 10%			40 Pin DIP Socket	XO-530
C15	Capacitor, 0.47UF, 50V MONO	XO-638	A2	7430 8-input "NAND" gate	XO-643
	AX-CM, 20%		A3, B2	74LS373 Octal D-type flip flop	XO-445
ALL UNMARKED CAPACITORS	0.1UF, 50V CM-AX	XO-230	A4	74LS74 Dual D-type flip flop	XO-434
ALL UNMARKED POLARIZED CAPACITORS	10UF, 25V TANT-AX, 10%	XO-127	B1, H1	LM324 Quad op-amp	XO-644
D1	Diode, MV5752	XO-270	B3	74LS244 Octal buffer/line driver	XO-117
DIP SW	DIP Switch, 4 Position, 8 Pin	XO-640		AD7528J DAC	XO-647
J2	Phone Jack	XO-744	E2	74LS374 Octal D-type flip flop	XO-96
P1	3 Pin Wafer Conn	XO-703	E3, G3, N4, S5	SP0250 Speech generator	XO-645
P3, P4	9 Pin Wafer Conn	XO-375	G4, T1	74LS04 Hex inverter	XO-418
R1	Resistor, 10M OHM, 5% 1/4W	XO-73	G5	74LS08 Quad 2-input "AND" gate	XO-86
R2, R5, R9,	Resistor, 1K OHM, 5% 1/4W	XO-5	H2, H3	4801 1K x 8 SRAM	XO-193
R10, R27, R28, R31,			H4, K4	AY-3-8913 Sound generator	XO-646
R33-R35, R39			H5, K5, N5,	74161 Synchronous presettable binary counter	XO-192
R3, R13	Resistor, 4.7K OHM, 5% 1/4W	XO-7	S1, T5	2732A 4K x 8 EPROM	XO-485
R4, R7, R8,	Resistor, 68 OHM, 5% 1/4W	XO-748	K2, K3, N3	R6502-13 CPU	XO-360
R22-R24			N1, T3	74LS245 Octal bus transceiver	XO-79
			N2, S3	74LS139 Dual 1 of 4 decoder	XO-419
			S2	74LS138 1 of 8 decoder/demultiplexor	XO-437
			T4		





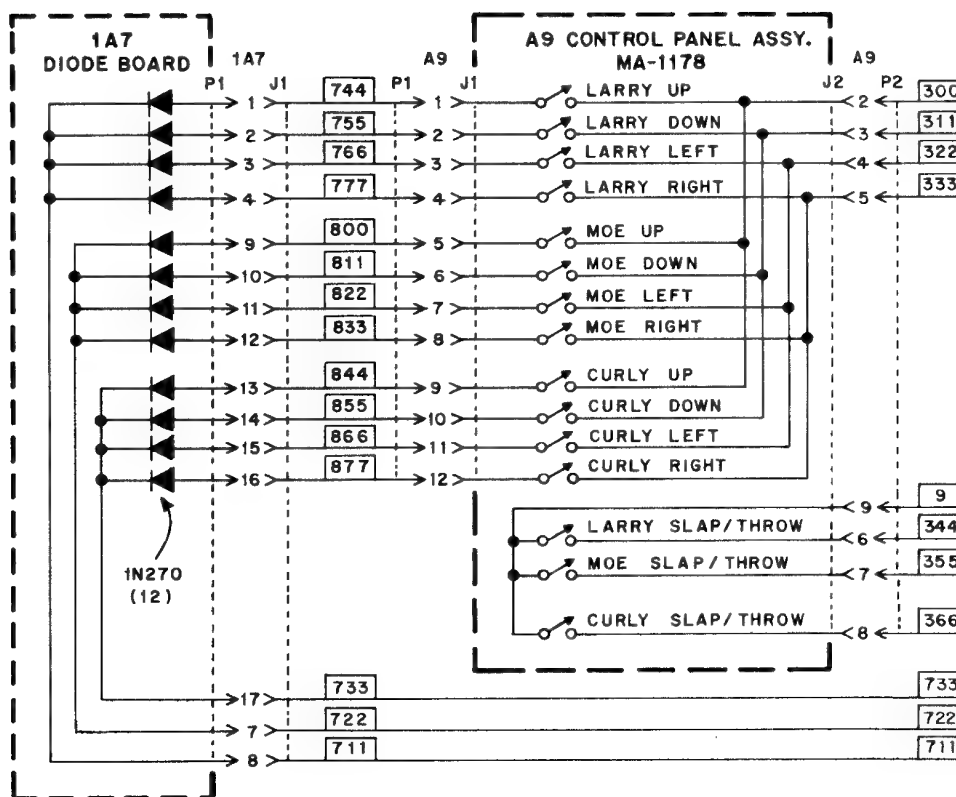
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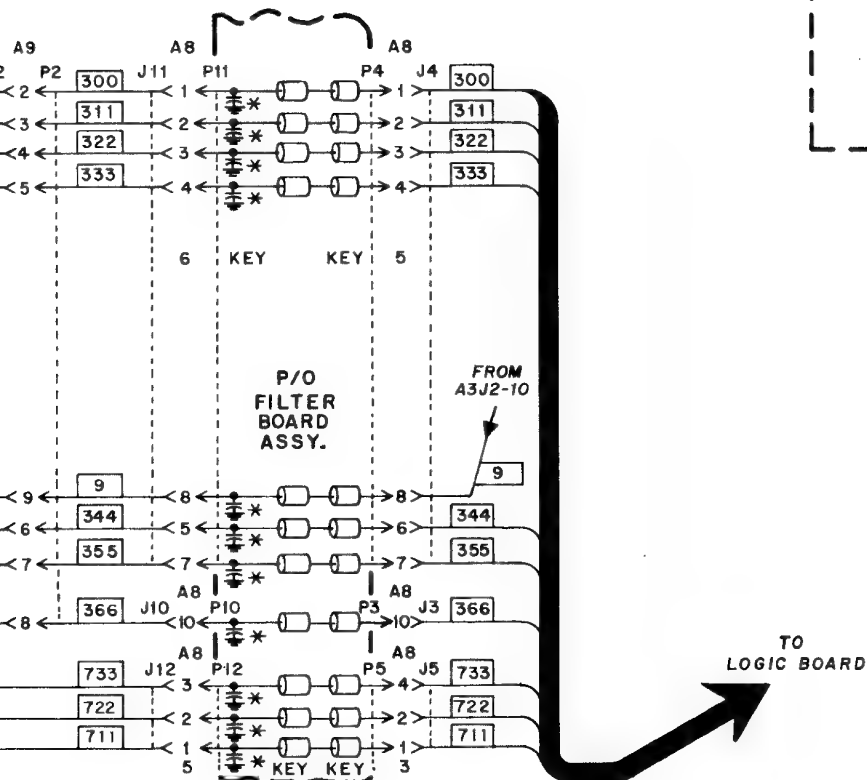
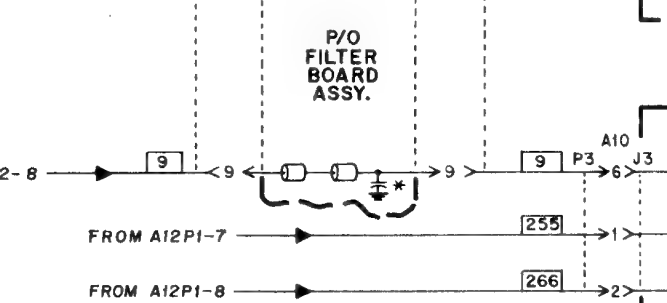
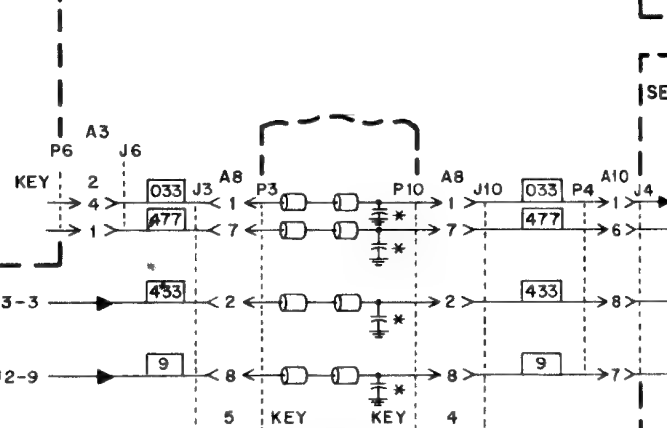
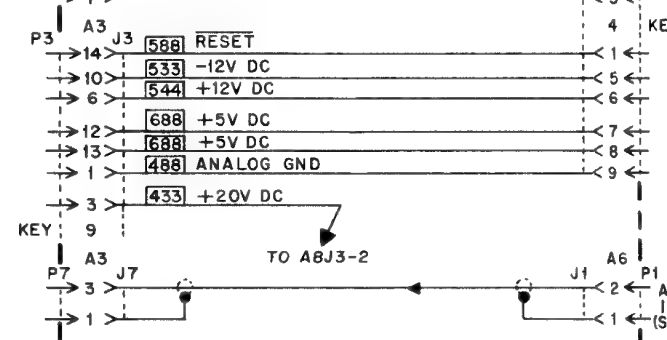
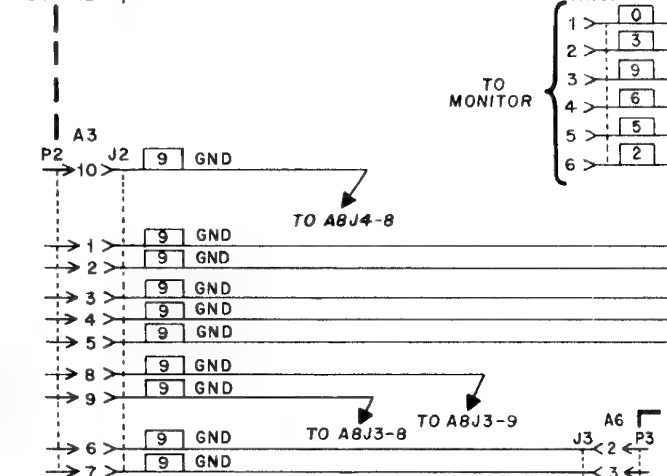
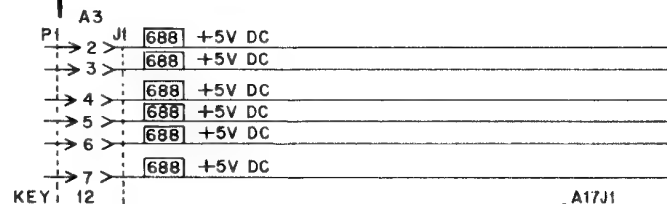
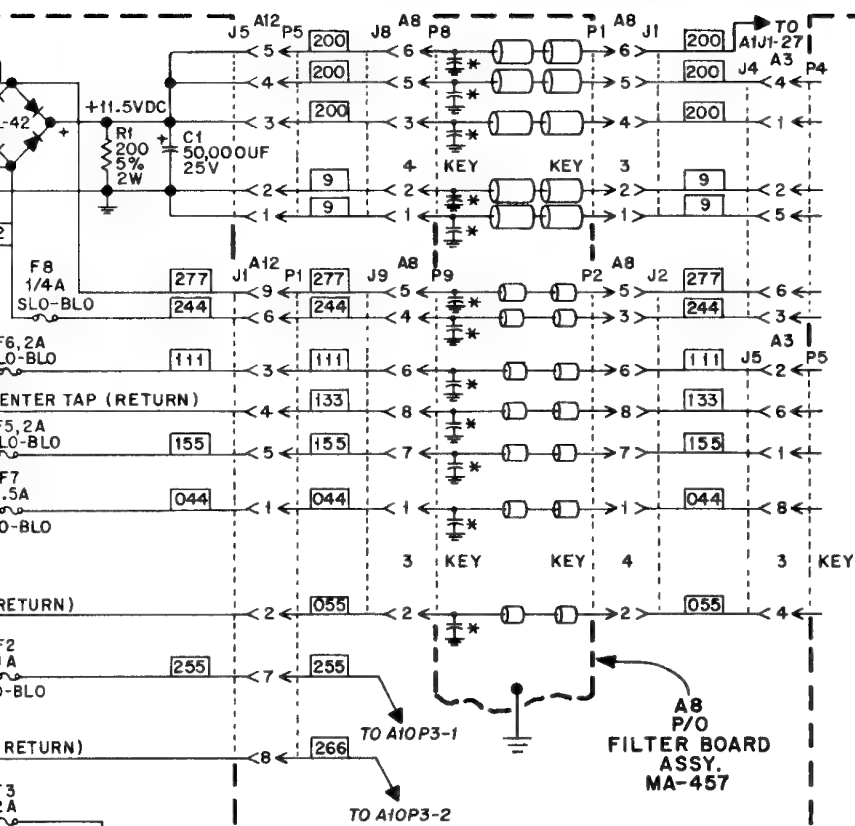
COLOR CODE	
0	BLACK
1	BROWN
2	RED
3	ORANGE
4	YELLOW
5	GREEN
6	BLUE
7	PURPLE
8	GRAY
9	WHITE

**NOTES:**

1. [xxx] INDICATES WIRE COLOR.
2. INDICATES CIRCUIT GROUND.
3. INDICATES EARTH GROUND.
4. \* INDICATES .01UF
5. \*\* INDICATES 39PF



# X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS





## **XI. PARTS INFORMATION**

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<b>CABINET PARTS (INTERIOR) ....</b>	<b>35</b>
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<b>FILTER BOARD ....</b>	<b>35</b>

## **XI. PARTS INFORMATION**

### **SPEAKER/MARQUEE ASSY., ILLUMINATION ASSY.**

ITEM	DESCRIPTION	PART NO.
1.	Illumination Assy.	MA-622
2.	Starter	EL-69
3.	Ballast (60HZ)	EL-70
4.	Lamp, Fluorescent	LA-4
5.	Cable Assy. (Illumination)	MA-626
6.	Speaker Assy.	MA-459
7.	Speaker	EL-83
8.	Speaker Grill	20931
9.	Illumination Trim	23067
10.	Cable Assy. (Speaker)	MA-318
11.	Marquee, Lexan	24080

### **CONTROL PANEL ASSY.**

ITEM	DESCRIPTION	PART NO.
1.	Control Panel Assy.	MA-1178
2.	Short Button;	
	White	21970
	Green	24041
	Blue	24042
3.	Button Holder and Switch (3)	21971
4.	Joystick (3)	23189
5.	Cable Assy.	MA-633
6.	Lexan Overlay	24079

### **SERVICE PANEL ASSY.**

ITEM	DESCRIPTION	PART NO.
1.	Service Panel Assy.	MA-620
2.	Cable Assy.	MA-624
3.	Switch (Pushbutton)	EL-57
4.	Switch (Toggle)	23506
5.	Volume Control	XO-199
6.	Coin Meter	EL-84

### **BOTTOM PANEL ASSY.**

ITEM	DESCRIPTION	PART NO.
1.	Bottom Panel Assy.	MA-618
2.	Transformer	23149
3.	Capacitor, 50,000UF, 25V	XO-342
4.	Resistor, 200 Ohm, 5%, 2W	XO-142
5.	Fuse, 3 Amp, SLO-BLO	EL-9
6.	Cable Assy. (Secondary)	MA-630
7.	Fuse, 1 Amp, SLO-BLO	EL-6
8.	Fuse, 12 Amp, SLO-BLO	FSI-83
9.	Bridge Rectifier	EL-42
10.	Fuse, 2 Amp, SLO-BLO	EL-7
11.	1.5 Amp, SLO-BLO	EL-34
12.	1/4 Amp, SLO-BLO	EL-5
13.	Service Outlet	18133
14.	Line Filter	EL-50
15.	Cable Assy. (Primary)	MA-631



# **XI. PARTS INFORMATION**

## **CABINET PARTS (INTERIOR)**

ITEM	DESCRIPTION	PART NO.
1.	Back Door	23073
2.	Interconnect Cable	MA-635
3.	Cable Assembly, Master Electronics	MA-636
4.	Bottom Panel Assembly	MA-618
5.	Sound/Speech Board Assembly	MA-1181
6.	Power Supply Assembly	MA-479
7.	Logic Board Assembly	MA-1182
8.	Filter Board Assembly	MA-457
9.	Shield, Top	22632
10.	Shield, Bottom	22633
11.	Clamp Bracket, Shield	22631
12.	Cable Assembly, High Voltage	MA-619
13.	Cable Assembly, Monitor	22620
14.	Cable Assembly, Front Door	MA-625
15.	Line Cord, Bushing and Plate	23366
16.	Rear Door Lock	23975
17.	Anchor Plate, Lock	23967
18.	Slam Switch and Bracket	23791

## **CABINET PARTS (EXTERIOR)**

ITEM	DESCRIPTION	PART NO.
1.	Lexan Overlay	24095
2.	Side Decal (2)	24103
3.	Top Glass	24039
4.	CRT Frame	24081
5.	Monitor Filter Glass	22849
6.	Monitor Mask	22463
7.	Monitor	21981
8.	Interlock Switch	EL-66
9.	Cover, Interlock Switch	21888
10.	Leg Adjuster	MH-21
11.	On-Off Switch	23799
12.	Switch Plate	18769
13.	Vent Channel	21754

## **FILTER BOARD**

ITEM	DESCRIPTION	PART NO.
	Filter Board Assy.	MA-457
A8P1	6 Pin Wafer Conn.	XO-373
A8P2	9 Pin Wafer Conn.	XO-375
A8P3	10 Pin Wafer Conn.	XO-336
A8P4	8 Pin Wafer Conn.	CO-339
A8P5	7 Pin Wafer Conn.	XO-335
A8P6	4 Pin Wafer Conn.	XO-369
A8P7	7 Pin Wafer Conn.	XO-335
A8P8	6 Pin Wafer Conn.	XO-373
A8P9	9 Pin Wafer Conn.	XO-375
A8P10	10 Pin Wafer Conn.	XO-336
A8P11	8 Pin Wafer Conn.	XO-339
A8P12	7 Pin Wafer Conn.	XO-335
A8P13	4 Pin Wafer Conn.	XO-369
A8P14	7 Pin Wafer Conn.	XO-335
	Capacitor, .01UF, 50V CM-AX +80%-20% (38 each)	XO-229
	Capacitor, 39PF, 50V CM-AX (6 each)	XO-334
	Ferrite Bead (22 each)	XO-337
	Ferrite Bead (66 each)	XO-338

# LIMITED WARRANTY

Mylstar Electronics, Inc. warrants to the initial purchaser of the Mylstar Electronics, Inc. machine that the items listed in the following schedule as installed and used in the original Mylstar Electronics, Inc. machine will for the applicable period set forth in the schedule, computed from the initial date of purchase from an authorized Mylstar Electronics, Inc. distributor, be free of defects in materials and workmanship:

## SCHEDULE

<u>GAME</u>	<u>ITEM</u>	<u>WARRANTY PERIOD</u>
Pinball	All Electronic Printed circuit boards	90 days
Pinball-Video	All Electronic Printed Circuit Boards	90 days
	Card Cage	90 days
	Television Monitor	30 days
Video	All Electronic Printed Circuit Boards	90 days
	Television Monitor	30 days
Video Disc	Video Disc Player	60 days

This Limited Warranty does not apply to any parts damaged in the course of handling or assembling by the customer or damage due to other than normal use or use in violation of instructions or reasonable practices, or further damaged in return shipment. This Limited Warranty is made only to the original customer, and is and shall be in lieu of all other warranties expressed or implied, and of all other obligations or liabilities on the part of Mylstar Electronics, Inc. and in no event shall Mylstar Electronics, Inc. be liable for any anticipated profits, consequential damages, loss of time, or other losses incurred by the customer in connection with the purchase or operation of Mylstar Electronics, Inc. machines or components thereof.

The registration card with each Mylstar Electronics, Inc. factory-wired machine must be filled in and returned to Mylstar Electronics, Inc. within ten days after date of purchase for this Limited Warranty to be effective. This Limited Warranty applies only to machines so registered.

THIS LIMITED WARRANTY IS IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS, AND OF ANY OTHER OBLIGATION ON THE PART OF THE SELLER AND MYLSTAR ELECTRONICS, INC.



**MYLSTAR  
ELECTRONICS  
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